

What is claimed is:

1           1.     A storage device comprising:  
2                 a probe having a tip, the tip being electrically conductive; and  
3                 a storage medium, the storage medium being electrically conductive and  
4 electrically contacted to the tip, wherein the tip is adapted to form a dent in the storage  
5 medium,  
6                 wherein the tip is adapted to cooperate with the storage medium to provide a  
7 variable resistance based on whether the tip is engaged in the dent.

1           2.     The storage device of claim 1, wherein the variable resistance has a first  
2 resistance value in response to the tip being engaged in the dent, and wherein the variable  
3 resistance has a second resistance value in response to the tip being engaged on a surface of  
4 the storage medium but not in the dent, the first resistance value being less than the second  
5 resistance value.

1           3.     The storage device of claim 2, further comprising a sensing device to detect  
2 current flow through the variable resistance between the probe and the storage medium.

1           4.     The storage device of claim 3, further comprising circuitry to indicate a first  
2 data state in response to detecting a first detected current corresponding to the first resistance  
3 value, and to indicate a second data state in response to detecting a second current value  
4 corresponding to the second resistance value.

1           5.     The storage device of claim 1, wherein a first surface area of the tip is  
2 electrically contacted to the storage medium in response to the tip not being engaged in a  
3 dent, and  
4                 wherein a second, larger surface area of the tip is electrically contacted to the  
5 storage medium in response to the tip being engaged in a dent.

1           6.       The storage device of claim 1, further comprising circuitry to apply a voltage  
2 to the probe, wherein the variable resistance is between the probe and the storage medium.

1           7.       The storage device of claim 6, further comprising an electrical conductor, the  
2 storage medium being between the electrical conductor and the probe.

1           8.       The storage device of claim 7, wherein the electrical conductor is electrically  
2 connected to a ground potential, the storage device further comprising a sensing circuit to  
3 detect a current flow through the probe, variable resistance, storage medium, and electrical  
4 conductor that is dependent upon the variable resistance.

1           9.       The storage device of claim 1, further comprising additional probes each  
2 having an electrically conductive tip electrically contacted to the storage medium,  
3                   wherein the storage medium has plural storage cells, the tips of at least some  
4 of the probes to form dents in respective storage cells,  
5                   wherein each tip cooperates with the storage medium to provide a variable  
6 resistance based on whether the tip is engaged in a dent.

1           10.      The storage device of claim 1, wherein the tip is heatable to form the dent.

1           11.      A system comprising:  
2                   a processor; and  
3                   a storage device coupled to the processor, the storage device comprising:  
4                   a probe having an electrically conductive tip;  
5                   a storage substrate having an electrically conductive layer electrically  
6 contacted to the tip,  
7                   the tip adapted to form dents in the electrically conductive layer,  
8                   the tip to interact with the electrically conductive layer to provide a  
9 signal path having a variable resistance based on whether the tip is engaged in a dent.

1           12.    The system of claim 11, wherein the variable resistance has a first resistance  
2 value in response to the tip being engaged on the surface of the electrically conductive layer  
3 but not engaged in a dent, and wherein the variable resistance has a second, smaller resistance  
4 value in response to the tip being engaged in a dent.

1           13.    The system of claim 12, wherein a first surface area of the tip is electrically  
2 contacted to the storage medium in response to the tip being engaged on a surface of the  
3 electrically conductive layer but not being engaged in a dent, and  
4                wherein a second surface area of the tip is electrically contacted to the storage  
5 medium in response to the tip being engaged in a dent,  
6                the second surface area being larger than the first surface area.

1           14.    The system of claim 11, wherein the probe comprises a nanotechnology probe.

1           15.    The system of claim 11, further comprising at least a second probe having an  
2 electrically conductive tip, the tip of the second probe adapted to form dents in the  
3 electrically conductive layer,  
4                wherein the tip of the second probe is adapted to interact with the electrically  
5 conductive layer to provide a second signal path having a variable resistance based on  
6 whether the tip of the second probe is engaged in a dent.

1           16.    The system of claim 15, wherein the storage device further comprises sensors  
2 to detect current flows through the signal paths.

1           17.    The system of claim 16, wherein each sensor is adapted to detect a first current  
2 in response to a corresponding signal path having a first resistance, and to detect a second  
3 current in response to a corresponding signal path having a second resistance.

1           18.     A method of storing data in a storage device, comprising:  
2                     writing to storage cells of a storage medium by forming dents in selected ones  
3 of the storage cells with a probe, wherein the storage medium is formed at least in part by an  
4 electrically conductive material;  
5                     electrically contacting an electrically conductive tip of the probe to the storage  
6 medium; and  
7                     during a read, detecting a resistance value of a signal path having variable  
8 resistance based on whether the electrically conductive tip of the probe is engaged in a dent in  
9 the storage medium.

1           19.     The method of claim 18, wherein detecting the resistance value of the signal  
2 path comprises:  
3                     detecting a first resistance value in response to the electrically conductive tip  
4 of the probe being engaged in a dent; and  
5                     detecting a second, larger resistance value in response to the electrically  
6 conductive tip of the probe being engaged on a surface of the storage medium but not in a  
7 dent.

1           20.     The method of claim 19, further comprising moving the storage medium with  
2 respect to the probe during each of the write and read operations.

1           21.     The method of claim 19, further comprising:                     —  
2                     indicating a first storage state in response to detecting the first resistance  
3 value; and  
4                     indicating a second storage state in response to detecting the second resistance  
5 value.